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1   Special section: Special issue on AI and Database research

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Jonathan J. King
October 1983 **ACM SIGART Bulletin**, Issue 86
Publisher: ACM Press
Full text available: 📄 pdf(3.84 MB)   Additional Information: full citation, abstract

> This collection of research summaries spans a very wide range of interests under the general heading of AI and Database research. In this introduction, I briefly describe the leading areas of interest that emerge from the reports submitted for this issue.

2   Selection criteria for expert system shells: a socio-technical framework

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Anthony C. Stylianou, Gregory R. Madey, Robert D. Smith
October 1992 **Communications of the ACM**, Volume 35 Issue 10
Publisher: ACM Press
Full text available: 📄 pdf(20.76 MB)   Additional Information: full citation, references, citings, index terms, review

Keywords: expert system development tools, expert system shells, software evaluation criteria, software selection

3   Deploying expert systems in Ada

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S. D. Lee, B. Allen
January 1989 **Proceedings of the conference on Tri-Ada '89: Ada technology in context: application, development, and deployment**
Publisher: ACM Press
Full text available: 📄 pdf(853.04 KB)   Additional Information: full citation, abstract, references, citings, index terms

> As the Department of Defense Ada mandate begins to be enforced actively, interest in deploying expert systems in Ada has increased. This paper introduces a prototype Ada-based expert system tool called ART/Ada. This prototype was built to support research into the language and operational issues of expert systems in Ada. ART/Ada allows applications of a conventional expert system tool called ART-IM (Automated Reasoning Tool for Information Management) to be deployed in various Ada environme ...

4 Artificial intelligence in the personal computer environment, today and tommorrow
(panel session)
Tom J. Schwartz, James Johnson, Steven Hardy, M. Mitchell Waldrop, Stan Curtis, Carroll
Ray Hall, Edward C. Patterman, Kenneth Ross, Wanda Rappaport, Aaron Goldberg, Henry
Seiler
October 1985 **Proceedings of the 1985 ACM annual conference on The range of
computing : mid-80's perspective: mid-80's perspective**
Publisher: ACM Press
Full text available: pdf(914.48 KB)   Additional Information: <u>full citation</u>, <u>index terms</u>

5 Heraclitus: elevating deltas to be first-class citizens in a database programming
language
Shahram Ghandeharizadeh, Richard Hull, Dean Jacobs
September 1996 **ACM Transactions on Database Systems (TODS)**, Volume 21 Issue 3
Publisher: ACM Press
Full text available: pdf(3.76 MB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>, <u>review</u>

Traditional database systems provide a user with the ability to query and manipulate one
database state, namely the current database state. However, in several emerging
applications, the ability to analyze "what-if" scenarios in order to reason about the impact
of an update (before committing that update) is of paramount importance. Example
applications include hypothetical database access, active database management systems,
and version management, to name a few. The central th ...

Keywords: active databases, deltas, execution model for rule application, hypothetical
access, hypothetical database state

6 Separating control from structural knowledge in construction expert systems
Andreas Günter, Roman Cunis, Ingo Syska
June 1990 **Proceedings of the 3rd international conference on Industrial and
engineering applications of artificial intelligence and expert systems -
Volume 2 IEA/AIE '90**
Publisher: ACM Press
Full text available: pdf(790.08 KB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>index terms</u>

In most expert systems for constructional tasks the knowledge base consists of a set of
facts or object definitions and a set of rules. These rules contain knowledge about correct
or ideal solutions as well as knowledge on how to control the construction process. In this
paper we present an approach that avoids this type of rules and thus the disadvantages
caused by them. We propose a static knowledge base consisting of a set of object
definitions interconnected by is-a and part- ...

7 Automated selection of mathematical software
Michael Lucks, Ian Gladwell
March 1992 **ACM Transactions on Mathematical Software (TOMS)**, Volume 18 Issue 1
Publisher: ACM Press
Full text available: pdf(1.63 MB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>

Current approaches to recommending mathematical software are qualitative and
categorical. These approaches are unsatisfactory when the problem to be solved has
features that can "trade-off" in the recommendation process. A quantitative system is
proposed that permits tradeoffs and can be built and modified incrementally. This

quantitative approach extends other knowledge-engineering techniques in its knowledge representation and aggregation facilities. The system is demonstrated ...

Keywords: ordinary differential equations, quantitative knowledge representation, software selection

8 Special issue: AI in engineering

D. Sriram, R. Joobbani
April 1985 **ACM SIGART Bulletin**, Issue 92
Publisher: ACM Press
Full text available: pdf(8.79 MB)   Additional Information: full citation, abstract

The papers in this special issue were compiled from responses to the announcement in the July 1984 issue of the SIGART newsletter and notices posted over the ARPAnet. The interest being shown in this area is reflected in the sixty papers received from over six countries. About half the papers were received over the computer network.

9 The STRIP rule system for efficiently maintaining derived data

Brad Adelberg, Hector Garcia-Molina, Jennifer Widom
June 1997 **ACM SIGMOD Record , Proceedings of the 1997 ACM SIGMOD international conference on Management of data SIGMOD '97**, Volume 26 Issue 2
Publisher: ACM Press

Full text available: pdf(1.68 MB)   Additional Information: full citation, abstract, references, citings, index terms

Derived data is maintained in a database system to correlate and summarize base data which records real world facts. As base data changes, derived data needs to be recomputed. This is often implemented by writing active rules that are triggered by changes to base data. In a system with rapidly changing base data, a database with a standard rule system may consume most of its resources running rules to recompute data. This paper presents the rule system implemented as part of the STandard Re ...

10 Process design of oil and gas production facilities using expert systems

Hafez Aghili, George Montgomery, Al Amlani, Jatin Shah
June 1988 **Proceedings of the 1st international conference on Industrial and engineering applications of artificial intelligence and expert systems - Volume 1 IEA/AIE '88**
Publisher: ACM Press
Full text available: pdf(754.72 KB)   Additional Information: full citation, abstract, index terms

An expert system known as the Automated Project Design System (APDS™) has been developed to assist process and facilities engineers in performing preliminary feasibility studies, optimization studies, and provide the basic information required for the initiation of the detailed design for offshore oil and gas production facilities. Given the feedstock and product specifications, the expert system produces a preliminary process flow diagram showing all major pieces of equipm ...

11 A simple expert system

B. I. Blum
March 1988 **ACM SIGBIO Newsletter**, Volume 10 Issue 1
Publisher: ACM Press
Full text available: pdf(621.62 KB)   Additional Information: full citation, abstract, index terms

Expert systems are one field of artificial intelligence (AI) that has received considerable recent attention. These systems generally are written in Lisp or Prolog -- languages that are interpretive, have flexible data accessing mechanisms, and use powerful string

manipulation tools. This raises two questions: what are expert systems, and can they be implemented using MUMPS? Some answers are presented in this paper.

12 Active database systems

Norman W. Paton, Oscar Díaz
March 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 1
Publisher: ACM Press

Full text available: pdf(2.68 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

Active database systems support mechanisms that enable them to respond automatically to events that are taking place either inside or outside the database system itself. Considerable effort has been directed towards improving understanding of such systems in recent years, and many different proposals have been made and applications suggested. This high level of activity has not yielded a single agreed-upon standard approach to the integration of active functionality with conventional databa ...

Keywords: active databases, events, object-oriented databases, relational databases

13 Experience of constructing a fault localisation expert system using an AI toolkit

Robert Inder
June 1988 **Proceedings of the 1st international conference on Industrial and engineering applications of artificial intelligence and expert systems - Volume 1 IEA/AIE '88**
Publisher: ACM Press
Full text available: pdf(1.00 MB)   Additional Information: full citation, abstract, references, index terms

The paper briefly outlines the operation of community clubs, a method of organising collaborative research which has proved effective within the UK government's Alvey programme, and focuses on one of the projects organised by the DAPES (the Data Processing Expert Systems) club: namely an expert system for localising a fault within a network of data communications equipment. Coming from a DP background, club members were particularly interested in methodical approaches to th ...

14 Special issue on prototypes of deductive database systems: DECLARE and SDS: early efforts to commercialize deductive database technology

Werner Kießling, Helmut Schmidt, Werner Strauß, Gerhard Dünzinger
April 1994 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 3 Issue 2
Publisher: Springer-Verlag New York, Inc.
Full text available: pdf(1.62 MB)   Additional Information: full citation, abstract, references, citings

The Smart Data System (SDS) and its declarative query language, Declarative Reasoning, represent the first large-scale effort to commercialize deductive database technology. SDS offers the functionality of deductive reasoning in a distributed, heterogeneous database environment. In this article we discuss several interesting aspects of the query compilation and optimization process. The emphasis is on the query execution plan data structure and its transformations by the optimizing rule compiler ...

Keywords: declarative reasoning, distributed query processing, heuristic control, multi-databases, productization, query optimizer

15 A predicate matching algorithm for database rule systems

Eric N. Hanson, Moez Chaabouni, Chang-Ho Kim, Yu-Wang Wang
May 1990 **ACM SIGMOD Record , Proceedings of the 1990 ACM SIGMOD international**

conference on Management of data SIGMOD '90, Volume 19 Issue 2
Publisher: ACM Press

Full text available: 📄 pdf(1.08 MB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>

Forward-chaining rule systems must test each newly asserted fact against a collection of predicates to find those rules that match the fact. Expert system rule engines use a simple combination of hashing and sequential search for this matching. We introduce an algorithm for finding the matching predicates that is more efficient than the standard algorithm when the number of predicates is large. We focus on equality and inequality predicates on totally ordered domains. This algorithm is well ...

16 Reasoning with worlds and truth maintenance in a knowledge-based programming environment

Robert Filman
April 1988 **Communications of the ACM**, Volume 31 Issue 4
Publisher: ACM Press

Full text available: 📄 pdf(1.80 MB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>, <u>review</u>

In traditional knowledge-based system development environments, the fundamental representational building blocks are mechanisms such as frames, rules, and attached procedures. The KEE system has been extended to include both a context (worlds) system and a truth maintenance system.

17 Static analysis techniques for predicting the behavior of active database rules

Alexander Aiken, Joseph M. Hellerstein, Jennifer Widom
March 1995 **ACM Transactions on Database Systems (TODS)**, Volume 20 Issue 1
Publisher: ACM Press

Full text available: 📄 pdf(2.79 MB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>, <u>review</u>

This article gives methods for statically analyzing sets of active database rules to determine if the rules are (1) guaranteed to terminate, (2) guaranteed to produce a unique final database state, and (3) guaranteed to produce a unique stream of observable actions. If the analysis determines that one of these properties is not guaranteed, it isolates the rules responsible for the problem and determines criteria that, if satisfied, guarantee the property. The analysis methods are presented ...

Keywords: active database systems, confluence, database rule processing, static analysis, termination

18 The personal electronic program guide—towards the pre-selection of individual TV programs

Michael Ehrmantraut, Theo Härder, Hartmut Wittig, Ralf Steinmetz
November 1996 **Proceedings of the fifth international conference on Information and knowledge management**
Publisher: ACM Press
Full text available: 📄 pdf(923.87 KB)   Additional Information: <u>full citation</u>, <u>references</u>, <u>index terms</u>

19 A structured approach for the definition of the semantics of active databases

Piero Fraternali, Letizia Tanca
December 1995 **ACM Transactions on Database Systems (TODS)**, Volume 20 Issue 4
Publisher: ACM Press

Full text available: pdf(4.15 MB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>, <u>review</u>

Active DBMSs couple database technology with rule-based programming to achieve the capability of reaction to database (and possibly external) stimuli, called events. The reactive capabilities of active databases are useful for a wide spectrum of applications, including security, view materialization, integrity checking and enforcement, or heterogeneous database integration, which makes this technology very promising for the near future. An active database system consists of ...

Keywords: active database systems, database rule processing, events, fixpoint semantics, rules, semantics

20 <u>An initial report on the design of Ariel DBMS with an integrated production rule system</u>
E. N. Hanson
September 1989 **ACM SIGMOD Record**, Volume 18 Issue 3
Publisher: ACM Press
Full text available: pdf(806.85 KB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>citings</u>, <u>index terms</u>

The design and implementation strategy for Ariel, A DBMS with a built-in production rule system (a trigger system), is described. Ariel is being built with the EXODUS database tool kit. The query language of Ariel is a subset of POSTQUEL extended with a new rule language. Effort is focussed on integrating the rule system with transaction processing, and making the rule system powerful and efficient. The current implementation of the rule condition-testing mechanism in Ariel is based on a va ...

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